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WHAT IS CLAIMED IS:

1. A sputtering target which comprises a target material comprising as constituent elements Ag, In, Te and Sb with the respective atomic percents (atom.%) of α, β, γ and δ thereof being in the relationship of:

$0.5 \leq \alpha < 8$,

$5 \leq \beta \leq 23$,

$17 \leq \gamma \leq 38$,

$32 \leq \delta \leq 73$,

$\alpha \leq \beta$, and

$\alpha + \beta + \gamma + \delta = 100$.

2. The sputtering target as claimed in Claim 1, wherein said target material comprises Sb, and $AgInTe_2$ with a stoichiometric composition and/or a nearly stoichiometric composition having a chalcopyrite structure and/or zincblende structure.

3. The sputtering target as claimed in Claim 2, wherein said $AgInTe_2$ in said target material is in the form of crystallites with a particle size of 450 Å or less.

4. A method of producing a sputtering target which comprises a target material comprising as constituent elements Ag, In, Te and Sb with the respective atomic

percents (atom.%) of α, β, γ and δ thereof being in the relationship of:

$0.5 \le \alpha < 8$,

$5 \le \beta \le 23$,

$17 \le \gamma \le 38$,

$32 \le \delta \le 73$,

$\alpha \le \beta$, and

$\alpha + \beta + \gamma + \delta = 100$,

comprising the steps of:

fusing a mixture of Ag, In and Te elements at a temperature in the range of 550°C to 850°C to prepare a fused mixture;

rapidly cooling said fused mixture to prepare a solid lump;

pulverizing said solid lump to prepare finely-divided particles;

mixing said finely-divided particles with Sb; and

sintering the mixture of said finely-divided particles and Sb.

5. A method of producing a sputtering target which comprises a target material comprising as constituent elements Ag, In, Te and Sb with the respective atomic percents (atom.%) of α, β, γ and δ thereof being in the relationship of:

$0.5 \le \alpha < 8$,

$5 \leq \beta \leq 23,$

$17 \leq \gamma \leq 38,$

$32 \leq \delta \leq 73,$

$\alpha \leq \beta$, and

$\alpha + \beta + \gamma + \delta = 100,$

comprising the steps of:

fusing a mixture of Ag, In, Te and Sb elements at a temperature in the range of 550°C to 850°C to prepare a fused mixture;

rapidly cooling said fused mixture to prepare a solid lump;

pulverizing said solid lump to prepare finely-divided particles; and

sintering said finely-divided particles.

6. The method of producing a sputtering target as claimed in Claim 4, further comprising the step of subjecting said mixture of said finely-divided particles and Sb to heat treatment at a temperature not higher than the melting point of said mixture, prior to said sintering step.

7. The method of producing a sputtering target as claimed in Claim 5, further comprising the step of subjecting said finely-divided particles to heat treatment at a temperature not higher than the melting

point of said finely-divided particles, prior to said sintering step.

8. An optical recording medium which comprises a recording layer comprising a phase-change recording material, capable of recording and erasing information by utilizing changes in the phase of said phase-change recording material in said recording layer, said phase-change recording material comprising as constituent elements Ag, In, Te and Sb with the respective atomic percents of α, β, γ and δ thereof being in the relationship of:

$1 \leq \alpha < 6$,

$7 \leq \beta \leq 20$,

$20 \leq \gamma \leq 35$,

$35 \leq \delta \leq 70$, and

$\alpha + \beta + \gamma + \delta = 100$.

9. An optical recording medium comprising:

a substrate, and a first heat-resistant protective layer, a recording layer comprising a phase-change recording material, a second heat-resistant protective layer and a reflective heat dissipation layer comprising a metal or an alloy, which are overlaid on said substrate in this order, said recording layer capable of recording and erasing information by utilizing changes in the phase

of said phase-change recording material in said recording layer, and said phase-change recording material comprising as constituent elements Ag, In, Te and Sb with the respective atomic percents of α, β, γ and δ thereof being in the relationship of:

$1 \leq \alpha < 6$,

$7 \leq \beta \leq 20$,

$20 \leq \gamma \leq 35$,

$35 \leq \delta \leq 70$, and

$\alpha + \beta + \gamma + \delta = 100$.

10. The optical recording medium as claimed in Claim 9, wherein said substrate bears a guide groove with a width of 0.25 to 0.65 μm and a depth of 250 to 650 Å.

11. The optical recording medium as claimed in Claim 9, wherein said phase-change recording material comprises $AgSbTe_2$ in a crystalline phase when no information is recorded in said recording layer and after information is erased therefrom.

12. The optical recording medium as claimed in Claim 9, wherein said substrate is in the form of a disk, said first heat-resistant protective layer has a thickness of 500 to 2500 Å, said recording layer has a thickness of 100 to 1000 Å, said second heat-resistant

protective layer has a thickness of 100 to 1500 Å, and said reflective heat dissipation layer has a thickness of 300 to 2000 Å.

13. The optical recording medium as claimed in Claim 8, wherein said recording layer further comprises a nitride and/or oxide comprising at least one of said constituent elements Ag, In, Te and Sb.

14. The optical recording medium as claimed in Claim 13, wherein said nitride comprises Te with a bond of Te-N.

15. An optical recording method for recording information in an optical recording medium comprising a disk-shaped substrate, and a first heat-resistant protective layer, a recording layer comprising a phase-change recording material, a second heat-resistant protective layer and a reflective heat dissipation layer comprising a metal or an alloy, which are overlaid on said substrate in this order, said recording layer being capable of recording and erasing information by utilizing changes in the phase of said phase-change recording material in said recording layer, and said phase-change recording material comprising as constituent elements Ag, In, Te and Sb with the respective atomic percents of α,

β, γ and δ thereof being in the relationship of $1 \le \alpha < 6$, $7 \le \beta \le 20$, $20 \le \gamma \le 35$, $35 \le \delta \le 70$, and $\alpha + \beta + \gamma + \delta = 100$, comprising the step of:

applying a semiconductor laser beam to said optical recording medium, with said optical recording medium being rotated at a linear speed of 1.2 to 5.6 m/s.

16. The optical recording method as claimed in Claim 15, wherein said disk-shaped substrate of said optical recording medium bears a guide groove with a width of 0.25 to 0.65 μm and a depth of 250 to 650 Å.

17. The optical recording method as claimed in Claim 15, wherein said phase-change recording material in said recording layer comprises $AgSbTe_2$ in a crystalline phase when no information is recorded in said recording layer and after information is erased therefrom.

18. The optical recording method as claimed in Claim 15, wherein said first heat-resistant protective layer has a thickness of 500 to 2500 Å, said recording layer has a thickness of 100 to 1000 Å, said second heat-resistant protective layer has a thickness of 100 to 1500 Å, and said reflective heat dissipation layer has a thickness of 300 to 2000 Å.

19. The optical recording method as claimed in Claim 15, wherein said recording layer further comprises a nitride and/or oxide comprising at least one of said constituent elements Ag, In, Te and Sb.

20. The optical recording method as claimed in Claim 19, wherein said nitride comprises Te with a Te-N bond.

21. A method of forming a recording layer for an optical recording medium comprising the step of: sputtering a target which comprises a target material comprising as constituent elements Ag, In, Te and Sb with the respective atomic percents of α, β, γ and δ thereof being in the relationship of:

$0.5 \leq \alpha < 8$,

$5 \leq \beta \leq 23$,

$17 \leq \gamma \leq 38$,

$32 \leq \delta \leq 73$,

$\alpha \leq \beta$, and

$\alpha + \beta + \gamma + \delta = 100$, in an atmosphere of argon gas, with nitrogen gas being contained therein with a concentration of 0 to 10 mol%.

22. The method of forming a recording layer for an optical recording medium as claimed in Claim 21, wherein

said target material comprises Sb, and $AgInTe_2$ with a stoichiometric composition and/or a nearly stoichiometric composition having a chalcopyrite structure and/or zincblende structure.

23. The method of forming a recording layer for an optical recording medium as claimed in Claim 22, wherein said $AgInTe_2$ in said target material is in the form of crystallites with a particle size of 450 Å or less.

24. The method of forming a recording layer for an optical recording medium as claimed in Claim 21, wherein when said nitrogen gas is contained in said atmosphere during said sputtering step, the partial pressure of said nitrogen gas (P_N) is set in the range of:

1×10^{-5} Torr $\leq (P_N) \leq 8 \times 10^{-5}$ Torr.

25. The method of forming a recording layer for an optical recording medium as claimed in Claim 22, wherein when said nitrogen gas is contained in said atmosphere during said sputtering step, the partial pressure of said nitrogen gas (P_N) is set in the range of:

1×10^{-5} Torr $\leq (P_N) \leq 8 \times 10^{-5}$ Torr.

26. The method of forming a recording layer for an optical recording medium as claimed in Claim 23, wherein

when said nitrogen gas is contained in said atmosphere during said sputtering step, the partial pressure of said nitrogen gas (P_N) is set in the range of:

1×10^{-5} Torr $\leq (P_N) \leq 8 \times 10^{-5}$ Torr.

27. The method of forming a recording layer for an optical recording medium as claimed in Claim 21, wherein prior to said sputtering step, the back pressure p therefor is set in the range of:

$3 \times 10^{-7} \leq p \leq 5 \times 10^{-6}$ Torr.

28. The method of forming a recording layer for an optical recording medium as claimed in Claim 22, wherein prior to said sputtering step, the back pressure p therefor is set in the range of:

$3 \times 10^{-7} \leq p \leq 5 \times 10^{-6}$ Torr.

29. The method of forming a recording layer for an optical recording medium as claimed in Claim 23, wherein prior to said sputtering step, the back pressure p therefor is set in the range of:

$3 \times 10^{-7} \leq p \leq 5 \times 10^{-6}$ Torr.

30. The method of producing an optical recording medium as claimed in Claim 21, wherein after said sputtering step, there is introduced into said atmosphere

a mixed gas comprising argon gas and nitrogen gas with the concentration of said nitrogen gas being higher than that in said atmosphere during said sputtering step.

31. The method of producing an optical recording medium as claimed in Claim 22, wherein after said sputtering step, there is introduced into said atmosphere a mixed gas comprising argon gas and nitrogen gas with the concentration of said nitrogen gas being higher than that in said atmosphere during said sputtering step.

32. The method of producing an optical recording medium as claimed in Claim 23, wherein after said sputtering step, there is introduced into said atmosphere a mixed gas comprising argon gas and nitrogen gas with the concentration of said nitrogen gas being higher than that in said atmosphere during said sputtering step.